

ten miles, but Mr. Paterson believes it to be considerably greater. When first seen, the upper part of the island was perfectly black, but it has now begun to whiten, owing to the droppings of the myriads of sea-fowl which frequent the adjacent coast and neighbouring islands, and seem already to have taken possession of the new land. The neighbourhood of Reykjanes is noted for volcanic manifestations—islands have from time to time risen and sunk there, and only a couple of years ago a violent eruption occurred near the spot where the new island lies; columns of smoke and steam rose out of the sea, and large quantities of pumice were thrown up and floated ashore on the neighbouring coast.

IT is stated that in consequence of the immense success obtained by the opening of the Arlberg Tunnel, France has confidentially sounded the Swiss Federal Council as to piercing the Alps at the Simplon.

A FATAL gas explosion took place in Paris four months ago near the Porte St. Denis, under circumstances quite similar to the accident which took place in Bermondsey last week. Since that time the Prefet de la Seine has appointed a Commission to determine the best manner of searching for gas escapes. An electric lamp fed with a portable accumulator has been selected and rendered obligatory for such operations. This apparatus has been described at length in the French illustrated papers. It might perhaps be improved, but the principle is quite sound, and it is to be regretted that the results of the French experiments have not become known in England.

WE have received a communication from Prof. M. Nyrén, Director of the Imperial Observatory at Pulkowa, near St. Petersburg, informing us that the weather there was so cloudy that not a vestige of the moon could be seen on the occasion of the recent total eclipse. In Helsingfors, where Prof. Nyrén happened to be that night on his return journey from abroad, he could distinguish the darkening of the moon's disk through the clouds, but it was too thick to observe the eclipse of the stars. At Dorpat, the second great Russian Observatory, the weather was also entirely unfavourable for observations. This is greatly to be regretted, in view of the elaborate preparations made by the Russian astronomers, to which we referred last week.

THE Royal Bohemian Society of Sciences will celebrate its hundredth anniversary at Prague on December 6 next.

THE new University building at Vienna was completed on the 11th inst. The new building at Strasburg will be inaugurated on the 26th inst.

THE death is announced of Dr. Robert Ave-Lallement, well known as a traveller in Brazil, who was born at Lübeck in 1812. He died there on October 10. Also of Dr. Wilhelm Gonnermann, a naturalist who, together with Dr. Rabenhorst edited the celebrated "Mycologia Europaea." He died at Coburg, aged seventy-eight years.

THE French Minister of Public Instruction has commissioned M. Brau de St. Paul Lias to proceed to Malacca and Sumatra for the purpose of making natural history collections. M. Etienne Gautier is to do the same in Persia and Asiatic Turkey; and Dr. Guardia goes to the Balearic Isles to study the dialect there.

THE life of a Ceylon planter appears to be a constant contest with insect pests of one kind and another. A short time since we noticed a correspondence on a "blight" which attacked the tea-plant, and now the Ceylon papers which arrived by the last mail contain a report, by Dr. Trimen, the head of the Botanic Gardens in the colony, on an insect which has caused much alarm by its depredations on cacao and cinchona plantations.

He thinks the only serious damage to cacao comes from the *Helopeltis antonii*, which appears to be a recent importation to Ceylon, although well known in Java. It is believed to be still in small numbers, and to be confined to certain localities, and the only remedy suggested by Dr. Trimen is that the planters should have it carefully sought for and destroyed.

WE are requested to announce that in future the ordinary meetings of the Essex Field Club will be held in the large hall of the Public Hall, Loughton, Essex. The first meeting of the winter session will be on Saturday next, the 25th inst., at seven o'clock.

A SOCIETY has been established at Vladivostok in Eastern Siberia for the purpose of exploring the Amour district, with a view of founding in Vladivostok a museum illustrative of the natural history of the region.

THE additions to the Zoological Society's Gardens during the past week include a Meadow Pipit (*Anthus pratensis*), six Twites (*Linota flavirostris*), a Linnet (*Linota cannabina*), eight Lesser Redpolls (*Linota rufescens*), British, presented by Mr. T. E. Gunn; two Robben Island Snakes (*Coronella phocarum*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; a Hardwick's Mastigure (*Uromastix hardwickii*) from India, presented by Mr. Cuthbert Johnson; a Moustache Monkey (*Cercopithecus cephus*) from West Africa, a Greater Sulphur-crested Cockatoo (*Cacatua sulphurea*) from Australia, a Blue and Yellow Macaw (*Ara ararauna*) from South America, deposited; six Coupys (*Myopotamus coypus*), three Cockateels (*Calopsitta novae-hollandiae*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

WOLF'S COMET.—The observations of this comet to the end of September having been found irreconcilable with parabolic motion, Prof. Krueger, the editor of the *Astronomische Nachrichten*, and Mr. S. C. Chandler, jun., of Harvard College, have investigated the elements by a general method, and find an elliptic orbit of very limited dimensions, the period of revolution being 6·55 years by Prof. Krueger's calculation, and 6·65 years by Mr. S. C. Chandler's. Other elements by the former calculation are as follows:—

Perihelion passage 1884 November 17·8999 G.M.T.

Longitude of perihelion	19° 20' 56"	{ M. Eq. ascending node 206° 35' 35"
" Inclination	25° 3' 54"	
Angle of eccentricity	33° 32' 29"7	
Log. semi-axis major	0° 544940	
Log. perihelion distance ...	0° 194792	

In such an orbit there would be a very close approach to the orbit of Jupiter in about 209° heliocentric longitude, where the distance between the two would be less than 0°12, and with Prof. Krueger's period of revolution there would be great perturbation early in the year 1875, so that it is possible the comet may not have been moving long in its present track. It will be interesting to examine this point further, when the major axis of the comet's orbit has been more accurately determined by a wider extent of observation.

We have thus two comets of short period brought to light in the same year. As regards Barnard's comet the length of revolution appears to be yet somewhat doubtful, Prof. Morrison of Washington assigning 6·43 years, and Dr. Berberich of Strasburg 5·50 years only.

THE NOVEMBER METEORS.—Assuming that these bodies are moving strictly in the orbit of the first comet of 1866, we find by Prof. Oppolzer's definitive elements that the nearest approach to the orbit of Mars is in about heliocentric longitude 0° 5', distance 0° 30'; the nearest approach to the orbit of Jupiter is in 198° 7', distance 0° 79'; in the case of Saturn the least distance of orbits is 0° 46 at 214° 9'; and in that of Uranus 0° 37 at 234° 2'. In 1866 the comet traversed the plane of the earth's orbit in 51° 4', distant therefrom only 0° 0066.

NEW SOUTHERN DOUBLE-STARS.—Mr. H. C. Russell, Government Astronomer at Sydney, has circulated a list of newly-detected double-stars, some found by himself with the large instrument, and others by Mr. Hargrave with the 7½-inch equatorial. In most cases the components belong to the tenth and eleventh magnitudes.

THE TOTAL SOLAR ECLIPSE OF 1816, NOVEMBER 19.—The first total eclipse of the sun in the present century in which the central line passed over Europe took place on the morning of November 19, 1816. Maps of its track appeared in the *Berliner Jahrbuch* for 1816, and in the first part of Hallaschka's *Elementa Eclipsium*, where the full computation of this eclipse is given as an example. In Lindenuau and Bohnenberger's *Zeitschrift für Astronomie*, vol. v., Hagen gives the moon's place deduced from Burckhardt's Tables, with the horizontal parallax and semi-diameter : if we combine these with similar quantities for the sun, taken from Carlini's Tables of 1833, we find the following elements of the eclipse :—

G.M.T. of Conjunction in R.A. 1816 Nov. 18 at 21h. 46m. 57s.

R.A.	...	...	...	...	...	234 42 20
Moon's declination	...	...	...	18	37 9 S	
Sun's	"	...	...	19	30 29 S	
Moon's hourly motion in R.A.	...	...	...	36	58	
Sun's	"	...	...	2	37	
Moon's	"	Decl.	...	11	37 S	
Sun's	"	...	...	0	38 S	
Moon's parallax	...	...	...	60	15	
Sun's	"	...	...	0	9	
Moon's semi-diameter	...	...	...	16	25	
Sun's	"	...	...	16	12	

In the *Berliner Jahrbuch* Bode makes the eclipse total at both Dantzig and Warsaw ; the above elements do not show totality at either place, but give the magnitudes 0'990 and 0'992 respectively. They indicate, however, a total eclipse at Bromberg, duration 1m. 22s. Possibly there may be other observations of the totality on record, but the only one we have found was made by Hagen at Culm in Bohemia, where he observed its commencement but not the ending. It would appear that the weather at this season was an impediment to observation, or more details of the total phase in its passage over Germany might have been expected. Before the eclipse of July 1842 there was only one in which the line of totality approached near the European continent, viz. that of July 17, 1833, which was total in Iceland ; on Mount Hecla the total eclipse commenced at 4h. 56m. 37s. a.m., and continued two minutes, the sun at an altitude of 13° ; but the days of physical observations had not then arrived, and we do not find it recorded that a midsummer expedition to Iceland was organised.

CHEMICAL NOTES

THERE has of late been a considerable amount of work done on the relations between the composition and structure of chemical compounds and various physical constants of these compounds ; and also on the relations between the conditions of chemical change and some of the physical properties of the constituents of the changing systems. Among the more important work on the former class of relations are to be mentioned Perkin's researches on the *magnetic rotatory polarisation* of compounds (*C. S. Journal, Trans.* for 1884, p. 421 *et seq.*) ; and Schiff's researches on the *coefficients of capillarity* of liquid carbon compounds (*Annalen*, cxxiii. 47). The investigations of Raoult on the connections between the freezing-points of solutions and the distribution of the salts therein form an important contribution to the study of the second group of relations (see especially *Ann. Chim. Phys.* (6), ii. p. 66, *et seq.*). Perkin has measured the rotations of the plane of polarisation of a ray of monochromatic (sodium) light, produced by passing the ray through columns of various liquid carbon compounds placed between the poles of a large electro-magnet. Then, by the use of the formula $\frac{r \times M}{d}$, where r = observed rotation, d = density, and M = molecular weight (as gas), of the given compound, he has calculated the magnetic rotatory effect of unit-length of the liquid obtained by condensing unit-length of the vapour of the same liquid. The observed results are thus referred to lengths of liquid related to each other in the ratio of the molecular weights of the various compounds examined.

Each result is divided by the number obtained, by the same method, for water, and the quotient represents the *molecular rotatory power* of the given compound. The molecular rotatory powers of a great many compounds belonging to twenty-six series have been determined, and the results show that the constant in question is closely connected with the valencies of the atoms, and with the distribution of the interatomic actions, in the molecules of the compounds examined. Schiff has made an extended series of determinations of the *coefficients of capillarity*, that is the capillary elevations in tubes 1 mm. radius, of many liquid carbon compounds. By multiplying this constant by the density of the compound, and dividing by 2, another constant is obtained which represents the weight of liquid raised by capillary action through unit-length of the line of contact between the liquid and the containing vessel. Lastly, by dividing the coefficient of capillarity by twice the "molecular volume" (i.e. $\frac{\text{molecular weight of gas}}{\text{density of liquid}}$), a quotient is obtained which represents the relative number of molecules raised along the line of contact between the liquid and solid surfaces. Schiff's results, although very numerous, do not yet allow very definite conclusions to be drawn regarding the connection between the three constants and the molecular structure of the compounds examined ; but that a definite connection exists is rendered very probable by these investigations. Raoult has made many determinations of the *molecular lowering of the freezing-point*—that is, the lowering of the freezing-point produced by the solution of 1 grammé-molecule of substance dissolved—of various solvents by acids, bases, and salts. The solvents employed were water, benzene, nitro-benzene, ethylene dibromide, acetic and formic acids. In each case the molecular lowering of the freezing-point is approximately equal to one of two values, of which one is double the other. The acids examined may be divided into two groups as regards their effect on lowering the freezing-point of water. The value of the constant measured by Raoult is approximately 40 for one of the groups, and 20 for the other group. The bases examined likewise fall into two groups ; the mean values of the constants being 39 and 19 respectively. Raoult states that the acids with the higher value (40) almost completely displace the acids with the lower value (20) from their combinations with bases, when the acids and salts react in equivalent quantities. The bases of the first group almost completely displace those of the second from their combinations with acids. Measurements of the molecular lowering of the freezing-point of water by the action of acids, bases, and salts, present us with data from which, according to Raoult, the distribution of the various acids, &c., in a changing chemical system may be deduced.

AMERICAN ORNITHOLOGISTS' UNION

THE second annual meeting of the American Ornithologists' Union was held in the American Museum of Natural History, New York City, September 30 to October 2, 1884, the President, Mr. J. A. Allen, in the chair.

The Active Members present were : J. A. Allen, H. B. Bailey, Chas. F. Batchelder, Eugene P. Bicknell, William Brewster, Montague Chamberlain, Dr. Elliott Coues, D. G. Elliot, Dr. A. K. Fisher, Col. N. S. Goss, Dr. J. B. Holder, Dr. C. Hart Merriam, Robert Ridgway, Thomas S. Roberts, John H. Sage, George B. Sennett, Dr. Leonhard Stejneger.

Dr. Philip Lutley Sclater, Mr. Howard Saunders, and the Rev. E. P. Knubley, of the British Ornithologists' Union, were also present, and were cordially invited to take part in the proceedings of the Union.

The Associate Members in attendance were William Dutcher, Fred T. Jencks, and Dr. Howard Jones.

On the recommendation of the Council the following persons were elected to Foreign Membership :—Heinrich Gätke, Heligoland ; Dr. W. Taczanowski, Russia ; Henry Seeböhm, England ; Howard Saunders, England ; Dr. H. Burmeister, Brazil.

The following among others were elected Corresponding Members :—Dr. John Anderson, F.R.S., India ; W. T. Blanford, F.R.S., London ; Major H. W. Feilden, London ; Dr. Hans Gadew, England ; Col. H. H. Godwin-Austen, London ; Dr. Julius von Haast, New Zealand ; Dr. E. Holub, Austria ; Dr. C. F. Homeyer, Germany ; E. L. Layard, New Caledonia ; Dr. A. B. Meyer, Germany ; Dr. A. von Mojsisovics, Gratz ; Dr. A. J. Malmgren, Finland, Dr. A. von Middendorff,